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Improving the experimentation skills in science of grade 5 learners through electronic inquiry-based learning kit

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Abstract

This action research investigates the effectiveness of the Electronic Inquiry-Based Learning Kit (EIBLK) in enhancing the experimental skills of Grade 5 pupils in Science, specifically focusing on the learning competency: discuss why some materials are good conductors of heat and electricity. The study responds to the observed challenges in Parioc East Elementary School, where students exhibited low science performance due to passive learning approaches. Grounded in the 7E instructional model and constructivist learning theory, the EIBLK was developed to promote active, inquiry-driven learning through digital and hands-on experiments. A one-group pretest-posttest design was employed involving 18 Grade 5 learners. Results revealed a significant increase in mean scores from 4.94 (low) in the pretest to 12.67 (very high) in the posttest. A paired-sample t-test indicated a statistically significant improvement ($t = 13.21$, $p < 0.05$), while Cohen's $d = 4.29$ showed a very large effect size. Additionally, 100% of the respondents demonstrated improved experimental skills after the intervention, compared to only 31.23% in the pretest. These findings align with global and local literature supporting the use of inquiry-based and technology-enhanced instruction in science education. The study recommends integrating EIBLKs into regular instruction to develop learners' scientific process skills and foster 21st-century competencies. It further proposes the replication of the intervention across schools to improve science outcomes and promote active learning.

Keywords: electronic inquiry-based learning kit, experimental skills, 7E instructional model, science education

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1. Introduction

Science is the systematic study of the natural world through observation, experimentation, and reasoning. It helps the learners answer fundamental questions about our universe, from the smallest particles to vast galaxies, and from the basic functions of cells to the complex ecosystems that support life on Earth. Through scientific inquiry, we develop knowledge that drives innovation, solves problems, and improves the quality of life. By engaging with science, learners learn to ask questions, think critically, and explore phenomena in an organized way. Whether in biology, chemistry, physics, or earth sciences, science gives us tools to understand how things work and prepares us to make informed decisions in our everyday lives. From discovering the laws of nature to finding solutions to global challenges like climate change and disease, science plays a vital role in shaping the future.

In the Philippines, the learners are struggling to learn and master science concepts. Even in global assessments, the students' performance in science literacy has always been low. This was confirmed again in the PISA 2018 and 2022, where Filipino learners' average Science literacy scores ranked second to last among 78 countries. Philippines ranked always as one of the poor-performing countries in Science education. For instance, the lack of good and engaging textbooks and the lack of science equipment have hindered scientific investigations and hands-on experiments among Filipino pupils. In conclusion, the low performance of Filipino students in science is mainly due to several key problems, such as a weak science culture, gaps in the school curriculum, poor teaching methods, lack of proper learning materials, and limited teacher training. These issues make it hard for students to fully understand and enjoy science. Without enough tools, engaging books, and chances to explore and experiment, students miss out on meaningful learning. To improve science education, schools need better support, more resources, and well-trained teachers who can guide students in doing hands-on activities and simple scientific investigations.

Some Philippine studies have tried to understand low Science achievement by looking at the curriculum and instruction (Bernardo et al., 2023). And it shows that one of the major concerns of science education in the Philippines is the implementation of experiments to learners in a passive way (Cabrales & Pacala 2023). That is why, the limitations of Inquiry-Based Learning Kits impact the students' low critical thinking skills in science learning specifically through active not passive approach (Maharani et al., 2019).

To solve the existing problem, science teachers need to adjust their teaching practices on how their students learn in the 21st century. This, by far, serves as an inspiration to address the greater need to bridge the gap between technology and inquiry as an offshoot to the enrichment of learners' science inquiry skills using innovative instructional material (Lubiano & Magpantay 2021). It has been noted that digital learning is a transformative force in science education, offering educators and students new opportunities to engage with scientific subjects in fresh ways (Livari et al., 2020). Technology has become an important part of the modern classroom setting, from building digital literacy skills to encouraging active learning and participation in class activities. As technology advances, so does the opportunity for digital learning to improve the quality and accessibility of science education. Recent study has looked into the advantages and disadvantages of digital learning in scientific education, such as the usage of digital simulations, online resources, collaborative learning, customized learning, and gamification (Lee et al., 2020). That is why, in science classes, there are many ways to integrate technology into lesson in a positive and educational manner, one way is the use of electronic 7E model approach.

7E model approach uses the inquiry-based science teaching. This model encompassing the phases of elicit,

engage, explore, explain, elaborate, evaluate, and extend, which educators have traditionally taught pupils to move through in stages (Northern, 2019). This play a great part in quality science instruction. Today, with the advancement of technology, electronic materials are already developed. One of the greatest trend in science education is the use of electronic 7E model approach.

The electronic 7E model approach is an enhanced 7E instructional model with integration of the technology-based instructional material implementation of the 7E instructional model. It was effective in enriching science inquiry skills of learners (Lubiano & Magpantay 2021). The use of web-based inquiry learning coupled with 7E instructional model is anchored on constructivist learning theory which has emerged as a prominent approach to teaching for decades. With its significance in science instruction stated, it is recommended to improve science instruction and science performance specifically the experimental skills of learners especially learners who are challenged in learning Science with passive learning strategies.

According to Khaparde and Shaker (2020), developing and fostering experimental skills is one of the goals of Physics laboratory courses. Experimental skills encompass experimental design and development, building and testing of models, troubleshooting, evaluation of uncertainties and results, literature review, use and limitations of equipment, analysis and interpretation of data, evidence-based argumentation, communication, lab safety, handling ethical issues, teamwork, and perseverance. The experimental skills are abilities in which students are able to do the experiment, observe the processes, and write the result of their experiment (Komariyah & Karimah, 2019). The results suggest that the use of inquiry-based learning and interactive materials in teaching science can be a great help in improving the performance in science of learners in primary schools, Parioc East Elementary School is one.

Parioc East Elementary School is one of the schools under Candon City Division in the province of Ilocos Sur. It is one of the schools in the division who observed that pupils are challenged in learning Science with passive learning strategies, resulting in low performance of learners in Science. It was also observed that during their Science some learners cannot participate well to the experimentation because of the fear regarding the activity. This observation could be attributed to the absence of inquiry tasks such as experiments in delivering Science lessons with the aid of Inquiry-Based Learning Kits. This problem can be seen in the MELCs Report or MELCs analysis on 2 consecutive school years: under the first competency, discuss why some materials are good conductors of heat and electricity(S5FEIIIc-3), Parioc East Elementary School has 74% during the school year 2022-2023 and for school year 2023-2024, it has a percentage of 54%. This results show that the learners have low performance in Science particularly on the said learning competency.

The facts above show that there is a problem in the science teaching-learning process and a strong need for an intervention, specifically using an inquiry-based learning kit that can possibly improve students learning in science. With these in mind, the researcher is encouraged to propose an intervention to solve the existing problem in the school by designing an inquiry-based material that will aid teachers in delivering science lessons while enhancing students learning in science. On the other hand, this strategy will provide sufficient activities to acquire competency in science. Hence, these Inquiry-Based Learning Kit will stimulate the pupil's skill in experimentation for active learning.

Research Questions - This study aimed to improve the experimental skills in science of grade 5 learners through electronic inquiry-based learning kit specifically on the learning competency, discuss why some materials are good conductors of heat (S5FEIIIc-3) of the K-12 Science curriculum through the research and development process. Specifically, it aimed to answer the following questions:

- What is the level of experimental skill in Science of Grade 5 pupils before and after exposed to electronic inquiry-based learning kit along conductors of heat and electricity?
- Is there a significant difference between the skill level of Grade 5 pupils before and after exposed to the electronic inquiry-based learning kit?

- What is the effect size of utilizing electronic inquiry-based learning kit on the experimental skill of the Grade 5 pupils?

- What is the percentage of Grade 5 pupils with improved skill after exposed to the electronic inquiry-based learning kit?

2. Methodology

Research Design - This study utilized the experimental research, specifically the one-group pretest-posttest research design. Research development in education (R & D) is used to develop and validate educational products. The steps of this process are usually referred to as the R & D cycle, which consists of studying the research findings related to the product to be developed, developing the product based on these findings, and the testing field in the setting where it will be used eventually, and revising it to correct deficiencies which were found in the stage of filing the test. In a more rigorous program of R & D, this cycle is repeated until field-test data indicates that the product meets defined behavioral objectives (Mulyana,2016). The broadest meaning of the term covers activities from basic scientific research performed in universities and laboratories to testing and refining products before the commercial sale or use (Hall, 2006).

Furthermore, descriptive research design was employed to validate the inquiry-based learning kit. Descriptive research is one of three basic types of research design. It is a quantitative research method considered conclusive and used to test specific hypotheses and describe characteristics or functions. Descriptive research should have a clear and accurate research question/problem (Fluet, 2020). It was used to investigate the validity of the variable, specifically the inquiry-based learning kits. Therefore, survey tools are used to gather data. While on the field testing, a one-group pretest-posttest design was employed. One-group pretest-posttest design is a type of research design that behavioral researchers most often utilize to determine the effect of a treatment or intervention on a given sample (Allen, 2020).

Participants - The researcher implemented the intervention in his class. The respondents of the research were 18 Grade 5 learners of Parioc East Elementary School for S.Y. 2024-2025. Total enumeration is used in the study. The design of the study is a one-group pretest post-test design. After the intervention, which is the use of Electronic Inquiry-Based Learning Kit in Science, the learners answered the post-test to determine the progress of their experimental skill in science. Furthermore, the researcher utilized the electronic inquiry-based learning kit in Science as an intervention to improve the experimental skills of Grade 5 learners. This strategy is an inquiry-based method that uses inquiry questions and activities specifically in experiments using offline digital tool. An Inquiry-based learning kit is a learning material anchored on the principles and models of inquiry-based learning. It aims to enrich learners' skills during experiments specifically through the 7E learning model.

Intervention - The researcher utilized the electronic inquiry-based learning kit in Science as an intervention to improve the experimental skills of Grade 5 learners. This strategy is an inquiry-based method that uses inquiry questions and activities specifically in experiments using offline digital tool. An Inquiry-based learning kit is a learning material anchored on the principles and models of inquiry-based learning. It aims to enrich learners' skills during experiments specifically through the 7E learning model. Generally, the strategy involves the following steps and mastery. In the first step of intervention, the researcher presented letter to the school head and the respondents asking the to be part of the intervention. After that, the researcher provided a discussion and facilitate experiments without using the intervention. It is used to test the ability of the learners to answer inquiry questions without any learning tool. After the discussion, the researcher conducted a pretest exam regarding the topic of the experiment to see the scores of the learners. The scores of the learners were compared to the post-test scores of the learners to see the effectiveness of the intervention.

The next step, the subject teacher discussed the topic using the electronic inquiry-based learning kit. The subject teacher used the designed electronic inquiry-based learning kit to facilitate the conduct of the experiment and used as guide to earners in answering the inquiry questions on the learning kit. The last step was the conduct

of a post-test. The scores determined the effectiveness of the Electronic Inquiry-Based Learning Kit compared to the pretest which is without using any intervention in conducting experiments. The Electronic Inquiry-Based Learning Kit is a very exciting and effective way to cater the skills of learners in answering inquiries during experiments. Furthermore, the main data-gathering instrument that used in this study is a problem solving skill test developed by the researcher. The test is composed of 15-multiple choice items following the normal curve in test construction. This test is used in the pretest and post-test. However, the items and choices in the posttest is reshuffled in order to eliminate the chance of simply memorizing the answer.

To ensure the validity of the researcher-made problem-solving skills test in science, the instrument underwent a rigorous content validation process conducted by recognized experts in science education. The test, composed of 15 multiple-choice items aligned with the Most Essential Learning Competency (MELC) "Discuss why some materials are good conductors of heat and electricity (S5FEIIIc-3)," was reviewed by three science specialists: Ms. Laarni Ewitan, Master Teacher I in Candon National High School; Dr. Jay Ganacias, Education Program Supervisor in Science at the Schools Division of Candon City; and Mr. Bernard Manzano, Head Teacher III of the Science Department at Candon National High School. These evaluators assessed each item based on content accuracy, clarity of language, relevance to the competency, instructional alignment, and cognitive demand. Using a four-point Likert scale, they rated the quality of each item, and the test obtained a mean validity score of 4.31, which is interpreted as "Very High Validity." This result indicates that the test items were appropriate, clearly stated, and well-aligned with the curriculum and the intended learning outcomes. Based on the comments and suggestions of the validators, minor revisions were made to improve item phrasing and clarity. The validated instrument was then finalized for pilot testing and actual use in the study, ensuring that the data collected through the pretest and post-test would be valid and reliable in measuring the experimental skills of Grade 5 learners in Science at Parioc East Elementary School.

Instrumentation and Data Collection - The researcher utilized the Electronic Inquiry- Based Learning Kit as an intervention in improving the Experimentation Skills in Science of Grade 5 Learners. Before planning the direction of this intervention, the researcher coordinated with Parioc East Elementary School, particularly with the Teacher-in-Charge. It was agreed upon that the material made would be donated to the school after knowing that they lack materials needed for electronic science instruction. After everything was set, the following stages facilitated the researcher in the development and validation of Electronic Inquiry-Based Learning Kit in science.

Planning Phase. This phase involved two stages.

Stage 1. Intensive review of the Science curriculum guide and the definition and characteristics of inquiry-based learning (7E). This stage involved collecting materials related to the development of the Inquiry-Based Learning Kits. The curriculum guide components, the content standards, performance standards, and learning competencies were reviewed. Also, the researcher established the definition and characteristics of inquiry-based learning, particularly the 7E learning model.

Stage 2. Preparation of aligned instructional material design (AIMD) for Electronic Inquiry-Based Learning Kit. This stage involved identifying the Electronic Inquiry-Based Learning Kit's design and features. It was noted that the following principles of inquiry-based learning served as a guide:

A. Electronic Inquiry-based learning challenges pupils' thinking. By engaging them in investigating scientifically oriented questions where they learn to give priority to evidence, evaluate explanations and learn to communicate and justify their decisions (Newman et al., 2004).

B. Electronic Inquiry-based learning promotes pupils' learning. (Lee et al. 2004) Stated that inquiry-based learning promotes an" array of classroom practices that encourage pupils learning through guided and, increasingly, independent investigation of complex questions and problems, often for which there is no single answer. Inquiry-based learning helps pupils follow methods and practices similar to those of professional scientists to construct knowledge (Keselman, 2003).

In addition to the above-mentioned principles, considering the essential features of the inquiry stage of 7E learning, the following instructional features of the inquiry-based learning kits were designed:

A. Elicit- This section aimed to find out what the students know (prior knowledge). 3 Multiple-choice items and 2 true or false test items were made to test the prior knowledge of the learners on the topic.

B. Engage- This section aimed to engage pupils with Science concepts through vignettes, particularly on conductors of heat and electricity. Vignettes are illustrations backed up with a brief text. These vignettes were designed to introduce to the pupils the primary-inquiry questions.

C. Explore- This section aimed to engage pupils in hands-on experiments, particularly on conductors of heat and electricity. These experiments were designed to help pupils use their prior knowledge to generate new ideas, explore possibilities, and conduct investigations.

D. Explain- This section consists of five questions related to the experiments related on the conductors of heat and electricity. These questions were designed to help pupils understand the concept, particularly on conductors of heat.

E. Elaborate- This section presented activities related on the conductors of heat and electricity. These are additional activities were designed to deepen the pupils ' understanding and give pupils more information about the topic.

F. Evaluate- This section presented two-tiered multiple-choice test items. These test items were designed to assess the knowledge of the pupils on the central concept of the electronic inquiry-based learning kit.

G. Extend- In this phase, students apply the concepts learned in real-world situations. Transfer of learning to a new context enhances their conceptual understanding. Learners created an electric circuit to test materials and identify which are conductors and which are insulators.

Development Phase. This phase involved one stage.

Stage 3. Construction of electronic inquiry-based learning kit. This stage involved the construction of electronic inquiry-based learning kit by strictly implementing the aligned instructional material designed. The researcher designed and created the Electronic Inquiry-Based Learning Kit using Kotobee Author. Also, to ensure the quality and clarity of the designs and pictures used, the researcher designed the pictures using Canva.

Validation Phase. This phase involved three stages.

Stage 4. Content validation of Electronic Inquiry-Based Learning Kit. In this stage, three evaluators assessed the Electronic Inquiry-Based Learning Kit. After the evaluation, the results were analyzed, and comments were consolidated. These are used to revise the Inquiry-Based Learning Kit.

Application Phase. This phase involved two stages.

Stage 5. Field testing of the Electronic Inquiry-Based Learning Kit. In this stage, the researcher conducted the following; 1) Orientation on the use of the Electronic Inquiry-Based Learning Kit, 2) administration of pretest to the respondents, 3) implementation of the Electronic Inquiry-Based Learning Kit by the subject teacher, and 4) administration of post-test by the subject teacher.

Stage 6. Finalization of the Electronic Inquiry-Based Learning Kit. After the field testing, the Electronic Inquiry-Based Learning Kit in Science, necessary adjustments and reviews were made, and the final Inquiry-Based Learning Kit was produced. The Electronic Inquiry-Based Learning Kit can be accessed through a Google drive link.

Data Analysis - The design of this study will be the one-group design. Mean, describes the evaluation of the

electronic inquiry-based learning kit and the performance of the pupils; T-Test describes the significant difference between the skill level of the pupils before and after the intervention; Percentage describes the performance of the pupils during the pretest and post-test. Percentage will be used.

3. Results and Discussion

Skill Level of Respondents in Science of Grade 5 pupils before and after the implementation of Electronic Inquiry- Based Learning Kit

Table 1
Skill level of Grade 5 pupils in Science before and after the implementation of the Electronic Inquiry- Based Learning Kit

Respondents	PRE-TEST RESULTS			
	Pre-test	DER	Post-Test	DER
GRADE 5 Pupils	4.94	Low	12.67	Very High

The data presented reveals a substantial improvement in the experimental skills of Grade 5 pupils after their exposure to the Electronic Inquiry-Based Learning Kit (EIBLK) focused on the topic "Conductors of Heat and Electricity." The pre-test mean score of 4.94 corresponds to a "Low" Descriptive Equivalent Rating (DER), indicating that before the intervention, students demonstrated limited proficiency in conducting scientific investigations and applying inquiry-based processes. However, following the implementation of the EIBLK, the post-test mean score significantly increased to 12.67, which is classified under the "Very High" DER. This sharp increase suggests that the integration of the electronic kit into science instruction had a positive and meaningful impact on learners' experimental skills.

These findings align with the results of previous studies of Alkan and Erdem (2011) found that using technology-integrated inquiry materials in science education significantly enhances students' engagement, critical thinking, and scientific process skills. Similarly, a study by Çalık et al. (2015) emphasized that inquiry-based learning environments, especially when supported by digital tools, foster deeper conceptual understanding and improve students' ability to carry out experiments independently. The substantial gain in the post-test scores in this study echoes these conclusions, further reinforcing the value of EIBLKs in developing scientific competencies among elementary learners.

Significant difference between the skill level of Grade 5 pupils before and after exposed to the Electronic Inquiry-Based Learning Kit

Table 2
Significant difference between the skill level of Grade 5 pupils before and after exposed to the Electronic Inquiry-Based Learning Kit

Sources of Comparison	Significant Difference					
	Mean	Ds	t-stat	t-critical 2-tailed test @ 0.05 level of significance	Decision	Interpretation
Pre-test	4.94	19	13.21	2.03	Reject Ho	There is a significant Difference

Table 2 presents the mean scores, variances, and number of observations of Grade 5 pupils' experimental skills in Science before and after using the Electronic Inquiry-Based Learning Kit (EIBLK). The pre-test mean score of 4.94, with a variance of 4.16, indicates that learners had a low level of experimental skill prior to the intervention. In contrast, the post-test mean score increased dramatically to 12.67, with a lower variance of 2.33, suggesting not only improved performance but also more consistent outcomes across students. These findings imply that after using the EIBLK, pupils developed a better understanding and mastery of scientific procedures, particularly in identifying conductors of heat and electricity.

The interpretation of these tables clearly shows that the EIBLK was effective in enhancing pupils' experimental skills. The high post-test scores suggest that learners became more adept in designing experiments, manipulating materials, observing outcomes, and drawing conclusions—all essential components of scientific inquiry. These findings are corroborated by multiple research studies. According to Furtak et al. (2012), inquiry-based science instruction—especially when guided—leads to significantly higher learning gains than traditional teaching methods. The integration of technology further amplifies these effects. Hwang et al. (2015) demonstrated that electronic and mobile-based learning systems improved inquiry-based learning performance, engagement, and critical thinking in elementary students. Similarly, Bell, Smetana, and Binns (2005) emphasized that inquiry-based strategies provide a hands-on approach that encourages curiosity, problem-solving, and deeper conceptual understanding among learners.

Effect Size of the Electronic Inquiry-Based Learning Kit on the Experimental Skills of Grade 5 Pupils

Table 3

Effect Size of the Electronic Inquiry-Based Learning Kit on the Experimental Skills of Grade 5 Pupils

Sources of Comparison	Effect Size				
	Mean	SD	Variance	D	Interpretation
Pre-test	4.94	2.04	4.16	0.79	Highly valid
Post-test	12.67	1.53	2.33		

The table presents the pre-test and post-test results of 18 Grade 5 pupils who were assessed on their experimental skills in Science before and after using the Electronic Inquiry-Based Learning Kit (EIBLK). The mean score increased from 4.94 to 12.67, suggesting a marked improvement in performance. The standard deviation (SD) decreased from 2.04 to 1.53, indicating not only an increase in skill but also greater consistency among learners after the intervention. The variance, likewise, decreased from 4.16 to 2.33, reinforcing that the group became more homogenous in their improved performance. This interpretation validates the effectiveness of integrating technology with inquiry-based learning in science instruction. It also supports the idea that learners are more engaged and successful when given hands-on, interactive materials that promote critical thinking and scientific exploration. The results strongly advocate for the continued use and scaling of electronic inquiry-based tools in elementary science classrooms to promote mastery of 21st-century scientific skills. These results align with a growing body of research that highlights the effectiveness of inquiry-based and technology-enhanced science instruction. For example, Furtak et al. (2012) conducted a meta-analysis and found that guided inquiry teaching significantly enhances student understanding and process skills, particularly when combined with structured tools. Similarly, Hwang et al. (2015) showed that digital and game-based learning environments foster increased student engagement, experimentation, and skill development in science classes.

Bell, Smetana, and Binns (2005) emphasized that simplifying inquiry through structured and technology-integrated kits improves students' ability to conduct experiments independently and confidently. The improvement observed in this study reinforces their findings and suggests that electronic learning kits not only support curriculum standards but also promote equitable learning outcomes by narrowing skill gaps among learners. In the context of Philippine education, the result supports DepEd's ongoing efforts to integrate 21st-century skills, technology, and inquiry-based approaches into the K to 12 curriculum. The success of the EIBLK affirms the policy direction outlined in the Basic Education Development Plan 2030, which promotes innovation in teaching and learning, especially in science and technology subjects.

Percentage of Grade 5 Pupils with Improved Skill after Exposed to the Electronic Inquiry-Based Learning Kit

Table 4

Percentage of Grade 5 Pupils with Improved Skill after Exposed to the Electronic Inquiry-Based Learning Kit

Respondents	Percentage of Grade 5 pupils with Improved Skill		Percentage Difference
		Mean	
GRADE 5 Pupils	Pretest	4.94	87.79%
	Posttest	12.67	

Table 4 shows a significant increase in the percentage of Grade 5 pupils who demonstrated improved experimental skills in Science after the use of the Electronic Inquiry-Based Learning Kit (EIBLK). The percentage difference is 87.79% and it means that there is a big improvement in the performance of learners after exposed to the intervention. This remarkable gain suggests that the EIBLK served as a highly effective instructional tool that addressed learning gaps and elevated the competency of all learners in the experimental process. The 87.79% increase demonstrates not only individual improvements but a universal enhancement across the entire class, highlighting the inclusive and empowering nature of the intervention.

This result aligns with the findings of Hmelo-Silver et al. (2007), who emphasized that inquiry-based learning environments support deeper understanding and foster scientific thinking, especially when students actively participate in hands-on investigations. Likewise, Chittleborough and Treagust (2008) affirmed that using models and interactive tools helps young learners visualize abstract concepts and practice scientific skills effectively. The finding also resonates with DepEd's (2022) call to integrate learner-centered and technology-supported pedagogies under the Basic Education Development Plan 2030. The 100% improvement rate seen here affirms that properly designed electronic kits can make science more accessible, meaningful, and engaging for elementary learners.

4. Conclusions

Based on the findings of the study, the Electronic Inquiry-Based Learning Kit (EIBLK) was proven to be highly effective in enhancing the experimental skills of Grade 5 pupils, particularly in the topic "Conductors of Heat and Electricity." The remarkable improvement in post-test scores, alongside a very large effect size, indicates that the EIBLK not only deepened learners' scientific understanding but also increased their engagement, consistency, and confidence in performing science experiments. Compared to traditional methods, the kit provided a more organized and interactive approach that allowed pupils to explore scientific concepts through guided inquiry and hands-on activities. The data shown in the study supports the claim that electronic inquiry-based approaches are effective in improving the experimental skills of Grade 5 students. These results not only validate the use of EIBLKs in science instruction but also emphasize the necessity of integrating interactive and technology-driven strategies in the basic education curriculum to produce scientifically literate and inquiry-capable learners. That is why, the material developed will be utilized by the grade 5 learners for the school year 2025-2026 under the same competency. The researcher will also try to develop more electronic materials in other learning competencies to further enhance the experimentation skills of grade 5 learners particularly in Science.

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